LANDAU
ASSOCIATES,
INC.
Environmental and Geotechnical Services

COLSF 7.5 VI

March 8, 1993

Mr. Dean Fowler, P. E.
Spokane County Utilities Department
North 811 Jefferson Street
Spokane, WA 99201

**RE: TECHNICAL MEMORANDA REGARDING
COLBERT LANDFILL RD/RA PROJECT NPDES ISSUES**

Dear Dean:

Attached are three memoranda related to NPDES issues that have arisen on the Colbert Landfill Remedial Design/Remedial Actions Project (Project). The memoranda included are:

- January 11, 1993 meeting memorandum (dated January 15, 1993) describing our understanding of the issues discussed and the decisions made during this meeting between Spokane County, EPA, Ecology and Landau Associates personnel
- February 11, 1993 technical memorandum that presents Landau Associates' comments on Ecology's December 22, 1992 letter regarding Project NPDES issues
- September 25, 1992 technical memorandum regarding background water quality data and predicted quality of treated groundwater for the Project (revised February 8, 1993).

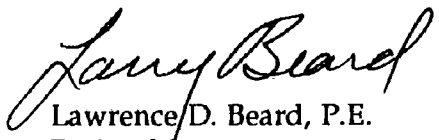
We have included six copies of each memorandum so that Spokane County can provide two copies to EPA and Ecology, and retain two copies for your files.

The first two memoranda identified above are self explanatory, but the third memoranda requires a brief explanation. Shortly after releasing the September 25, 1992 memo, errors were identified in Tables 1 and 2. Constituent concentrations for some metals in the "Estimated Effluent Concentrations" column of Table 1 were not "U" (undetected) flagged, as they should have been, which erroneously indicated anticipated discharge at detectable concentrations for the subject constituents. Water quality criteria Table 2 were inadvertently truncated to one decimal place resulting in the representation of criteria as "0.0" for constituents with criteria values of less than 0.1 ug/l. Although these errors were identified to Ecology during their review of the memorandum, we are reissuing the memorandum with these errors corrected to avoid any misunderstanding. No changes were made to the memorandum beyond the table corrections identified.

If you have any questions, please contact us.

LANDAU ASSOCIATES, INC.

By:



Lawrence D. Beard, P.E.
Project Manager

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6 Copies Submitted
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Technical Memorandum

TO: Dean Fowler, P.E.
Spokane County

FROM: Lawrence D. Beard, P.E.
Landau Associates

RE: COMMENTS ON ECOLOGY'S DECEMBER 22, 1992 LETTER REGARDING NPDES ISSUES FOR THE COLBERT LANDFILL PROJECT

DATE: February 11, 1993

INTRODUCTION

This memorandum provides Landau Associates' comments on the Washington State Department of Ecology (Ecology) December 22, 1992 letter regarding NPDES issues for Colbert Landfill Remedial Action Project (Project) discharge of treated effluent to the Little Spokane River. The December 22, 1992 letter presents Ecology's proposed monitoring parameters and associated design criteria they have identified for the Project, and identifies other NPDES design and operational issues related to Project discharges. The substance of Ecology's comments is presented in attachments to their letter that they identified as follows:

- General Comments
- Attachment A - Uncertainties and Safe-Guards in Monitoring Parameter Selections (2 pages)
- Attachment B - Evaluation of Potential Contaminants of Concern (6 pages)
- Attachment C - Detailed Evaluation of Potential Contaminants of Concern and Indicator Volatile Organic Compounds (4 pages).

Our comments are subdivided into the major issues of concern. The order of presentation (in general) reflects the order in which the issues arise in Ecology's letter and does not indicate a specific order of significance or importance for the various issues.

Prior to discussing the NPDES issues resulting from Ecology's letter, it is important to reiterate our understanding of Spokane County's basic position concerning the NPDES status for the Project so that our comments are not construed as concurrence with Ecology's apparent intent to expand NPDES considerations beyond that previously identified in the Record of Decision (ROD) for the Project. The Project Constituents of Concern (1,1,1-TCA, 1,1-DCE, 1,1,-DCA, TCE, methylene chloride, and tetrachloroethylene) were identified in the Remedial

Investigation (RI), and air stripping was identified as the most cost-effective treatment technology in the Feasibility Study (FS). The EPA Record of Decision (ROD) addressed NPDES as a Project ARAR (applicable, or relevant and appropriate requirement), and identified air stripping as adequate treatment prior to discharge to surface water. The Project Consent Decree requires treatment for the Constituents of Concern and not for other chemical constituents. As a result, only constituents added to, or altered by, the treatment process should be considered by Ecology in evaluating potential NPDES discharge limits for constituents other than the Constituents of Concern. Spokane County has agreed to characterize anticipated effluent water quality for other constituents at the request of Ecology, but has not altered its position that the remedial action is only required to treat for the Constituents of Concern.

PROPOSED DESIGN CRITERIA

Ecology presents proposed NPDES monitoring parameters and associated design criteria in Comment 1 of the General Comments attachment. The constituents identified as monitoring parameters appear to be reasonable. However, the Project treatment facility will only treat volatile organic compounds (VOC) required by the Project Consent Decree, and it is not appropriate for Ecology to identify (or the County to accept) additional design criteria for parameters which the treatment system is not capable of treating, unless the criteria are for chemical being used in the treatment process. To do so would imply that Spokane County can (or will) control discharge of these parameters. It would be more appropriate to identify the non-VOC parameters as "constituents of interest" for monitoring during Phase II operation.

The design criteria identified in General Comment 1 for the VOC Constituents of Concern are the ROD Performance Standards. Although this is appropriate for design, the Consent Decree Scope of Work specifies that the treatment facility does not require modification unless the Evaluation Criteria are exceeded; and the Elevation Criteria are 10 times higher than the Performance Standards for methylene chloride and tetrachloroethylene. As a result, the NPDES discharge criteria for the VOC Constituents of Concern should be equivalent to the Evaluation Criteria.

PHOSPHOROUS

Although the proposed design criteria identified in General Comment 1 for most monitoring parameters is not anticipated to be exceeded for Phase II effluent discharge, the proposed criterion for phosphorous (25 µg/L) is unlikely to be achieved. The proposed criterion

applies to the average euphoric zone concentration of total phosphorous in the Spokane River from Long Lake Dam to Nine Mile Bridge during the period of June 1 to October 31 [WAC 3-201-080(106)(a)]. This criterion is intended to inhibit algae blooms in Long Lake. However, there are a number of considerations discussed in the following paragraphs of this section that indicate the proposed phosphorus criterion should not be applied to the Project.

The highest concentration of phosphorous measured during Landau Associates' NPDES evaluation was 1.6 mg/L, and the other samples were all 0.5 mg/L, or less. The 1.6 mg/L sample was from Well CD-47C2, which appears to be the location least impacted by the Colbert Landfill of those wells sampled for the NPDES evaluation. As a result, phosphorous concentrations may be a naturally occurring background condition. Because the Little Spokane River is the ultimate discharge point for the majority of groundwater in the Colbert Landfill vicinity, any background phosphorous concentration in the groundwater should be "netted out" from consideration for Project discharges. Although phosphorous appears to possibly be related to background conditions, additional sampling and analysis will be required to evaluate whether or not this is the case.

It is our understanding that Ecology will accept the approach of netting out phosphorous, if it can be adequately demonstrated that phosphorous is a background condition and that the Little Spokane River is the discharge point for site groundwater. As a result, characterizing phosphorous background groundwater concentrations should be performed, and background phosphorous netted out, prior to actively pursuing relief from Ecology's proposed phosphorous criterion based on the other considerations subsequently identified in this section.

Project discharges will occur on a tributary to the Spokane River approximately 20 river miles upstream from the location of interest. An upstream and downstream limit to application of the phosphorus criterion is identified in the WAC, which suggests that Ecology's intent is not to apply the criterion to all upstream discharges. Additionally, phosphorous is highly susceptible to solid phase partitioning and to uptake by aquatic plans and organisms. As a result, it is quite possible that phosphorous discharges occurring at the Project outfall will not reach the Spokane River. Also, any assessment of the impact of Project phosphorous discharges on the Spokane River should occur at the confluence of the Little Spokane River and Spokane River, where the impact on the water body of interest will occur.

The phosphorous criterion for the Spokane River is not based on its toxicological effects on human health or aquatic organisms, but rather on preventing algae blooms in Long Lake. Although preventing algae blooms may be a reasonable goal, the phosphorous criterion should

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not carry the same weight as criteria based on human health or aquatic toxicity. As such, the proposed phosphorous criterion should fall into the "to be considered" category for NPDES considerations, rather than directly applied criteria.

Although all NPDES permits for the Spokane River have not been reviewed, it does not appear that the 25 µg/L phosphorous criterion is being applied directly to major phosphorous dischargers to the Spokane River. Information provided by the City of Spokane indicates that the City's wastewater treatment plant treats phosphorus at an influent concentration of about 4.5 mg/L, and discharges at a concentration of about 500 µg/L and a mass flux 120 pounds per day of phosphorous; the City's NPDES permit does not contain limits for phosphorus concentration or mass flux. It is also our understanding that the Post Falls, Hayden Lake , and Liberty Lake sewer districts discharge to the Spokane River, but do not treat for phosphorus. As a result, Ecology appears to be applying a significantly more stringent phosphorous criterion to the Project than to other dischargers, including those that may more significantly effect phosphorous concentrations in the Spokane River.

In Attachment B, page 4, Table 2, Ecology identifies total phosphorous as a potential contaminant of concern, and indicates that it is being considered because of the Memorandum of Agreement for the Spokane River Phosphorous Management Plan (MOA). We understand that the MOA was not signed by Spokane County. The MOA was implemented after signing of the Project Consent Decree and, therefore, is not applicable to Project discharges. It should also be noted that the MOA specifically addresses the Spokane River and makes no reference to the Spokane River Basin or tributaries to the Spokane River, and, thus, does not appear to address Project discharges which occurred 20 river miles upstream of the Spokane River.

Ecology identifies the MOA-allowed contribution of phosphorous from the Little Spokane River to the Spokane River to be 35.7 kg/day. Although the MOA does not appear to be applicable to the Project, the identified allowable mass appears to represent a significantly greater concentration than 25 µg/L under low flow conditions; or a much higher flow than the seven day, ten percent probability low flow ($7Q_{10}$) value for the Dartford station is being used. The Remedial Investigation identifies the $7Q_{10}$ low flow discharge for the Little Spokane River to be 75 cubic feet per second (cfs) at the Dartford Gauging Station. The average mass flux of 35.7 kg/day at a flow rate of 75 cfs represents more than 190 µg/L, rather than the 25 µg/L proposed as the Project phosphorous criterion. Conversely, a flow rate of about 580 cfs is required to produce a mass flux of 35.7 kg/day for a phosphorus concentration of 25 mg/L. It appears that Ecology is either identifying a more stringent concentration criterion for the Project

than that identified for the Little Spokane River as a whole, or Ecology is not considering the full flow of the Little Spokane River at its discharge to the Spokane River when evaluating the dilution effects of the river on Project discharges. Ecology should clarify the basis for these phosphorous values. It should also be noted that WAC 173-201 only identifies a concentration limit for phosphorus, so the mass flux limit does not appear to be directly relevant to the Project.

If phosphorous treatment were to be considered, there does not appear to be any known, available, and reasonable technologies (AKART) that would significantly reduce Project phosphorous concentrations or achieve the identified criterion of 25 µg/L. Chemical precipitation methods commonly used for phosphorous treatment are not capable of reducing concentrations significantly below the 500 µg/L level anticipated for Phase II effluent. The probable method required to achieve a 25 µg/L concentration would be ion exchange, possibly preceded by chemical precipitation, to eliminate process interferences from other inorganic constituents, such as calcium carbonate. Preliminary cost estimates were provided in the Landau Associates March 10, 1992 Preliminary Treatment and Discharge Plan (T&D Plan) for these pretreatment processes. The present worth cost for ion exchange would be approximately $18 million. If chemical precipitation pretreatment was required, the total pretreatment costs for phosphorous would be significantly greater. Additionally, both of these processes generate large volumes of waste that would require handling and disposal. Considering the cost, utilization of resources, and generation of waste resulting from phosphorous treatment, there does not appear to be a net benefit gained by phosphorous treatment, and the processes required do not appear to be reasonable for anticipated Project flow rates. As a result, it would appear that AKART is already being met for the Project (as is identified in the ROD) and additional treatment should not be necessary.

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DILUTION ZONE

Ecology identifies the monitoring location for all monitoring parameters, except total phosphorous, to be the outfall in General Comment 1. Although Ecology states that the identified monitoring parameters and proposed criteria are not the substantive requirements, it is implied by identifying the monitoring location as the outfall that a dilution zone will not be applied to these parameters. Ecology has stated in previous correspondence that application of a dilution zone to Project discharges is appropriate. It should be clarified with Ecology that the location for compliance monitoring will be established during Phase II operation at the boundary of the dilution zone, after the need for a dilution zone is established.

ACID BATCH CLEANING SOLUTION

General Comment 3A identifies the acid batch cleaning solution as a separate waste stream that requires treatment prior to discharge to achieve AKART requirements. The currently planned facility includes a batch cleaning system utilizing offsite treatment and disposal of spent batch cleaning solution. An onsite acid batch cleaning solution holding and discharge system will be designed, but will not be constructed unless scale accumulation observed during Phase II operation is sufficient to make it cost-effective. As a result, there does not appear to be a reason for Spokane County to pursue approval to discharge spent acid batch cleaning solution to the Little Spokane River at this time. However, Spokane County should reserve the right to request approval for discharge at a later date, if necessary.

OPERATIONAL CRITERIA

Ecology indicates in Attachment A to their letter that the stripping tower will be expected to perform at maximum efficiency, and if the tower can achieve effluent concentrations that are lower than the Performance Standards, discharge standards will be lowered to assure that maximum removal is achieved. The Performance Standards (as modified by the Evaluation Criteria) are established as the discharge criteria in the Consent Decree and have been agreed to by EPA and Ecology. The identification of more stringent criteria would violate this agreement, and should not be accepted by Spokane County.

The stripping tower is designed to operate at "maximum efficiency," although this is not the same as "maximum capacity" (which appears to be Ecology's intent). Additional treatment capacity must be reserved to accommodate potential increases in extraction rates, as well as to allow treatment system components (pumps and fans) to operate in their design efficiency range, and to allow for reduced efficiency with time (resulting from potential scale build up and normal wear and tear). Requiring operation at maximum capacity and reducing discharge criteria eliminates the operational flexibility needed to achieve efficient and cost-effective, long-term operation.

Ecology also states in Attachment A to their letter that Spokane County needs to include a description of how maximum efficiency of the treatment system will be established and maintained in the Final T&D Plan. Such a description is already present in the Preliminary T&D Plan, and Ecology should be referred to Section 2.3.1 and the associated tables. The description of the air stripping tower final design indicates that the Performance Standards can be achieved for maximum anticipated concentrations and flow rates with an air/water ratio

(volume/volume) of 100 and a packed tower height of 44 ft (see Table 2-7 of the Preliminary T&D Plan). Based on these results, coupled with the incorporation of excess capacity , a minimum packed tower height of 50 ft and an air to water ratio of 120 were selected as the basis of design. The basis of design significantly exceeds the requirements identified during final design, providing sufficient capacity to address unanticipated conditions. Specific operational procedures for the treatment facility will be presented in the Operation and Maintenance Plan, not the Treatment and Discharge Plan. Operational procedures will be developed to meet the discharge criteria and maintain efficient, cost-effective, long-term operation.

EFFLUENT METALS CONCENTRATIONS

Ecology identified arsenic, mercury, selenium, and thallium as potential Contaminants of Concern in Table 2 of Attachment B. Table 2 indicates that these metals were considered potential contaminants of concern because the estimated effluent concentration is greater than applicable criteria. This statement is incorrect and results from an error in Table 1 of Landau Associates' September 25, 1992 memorandum regarding NPDES water quality analyses. The estimated effluent concentration identified in Landau Associates' Table 1 was a calculation column that, in some instances, did not place the appropriate nondetect qualifier after the calculated value. None of the subject metals were detected in any of the groundwater samples collected during Landau Associates' investigation. Ecology was informed of the error, which is probably the reason that those metals were not considered further as Contaminants of Concern. However, the record should be clarified to reflect that those metals were not detected in site groundwater samples. A corrected version of Table 1 will be sent to recipients of Landau Associates September 25, 1992 Technical Memorandum in a subsequent transmittal.

ADDITIONAL SURFACE WATER QUALITY INVESTIGATION

Ecology indicates in the second to last paragraph of Attachment C, that under worst case conditions, 1,1-dichloroethylene would exceed the federal water quality criterion for water and fish ingestion (0.033 µg/L). As a result, Ecology indicates that Spokane County needs to provide documentation that shows no one receives their drinking water supply from within ½ mile of the proposed outfall. The Performance Standard for 1,1-dichloroethylene was established in the ROD, and discharge to the Little Spokane River at the Performance Standard concentrations is specifically referenced. The MCL concentration of 7 µg/L was established by EPA, and accepted

by Ecology, for Project discharge and it should not be necessary for Spokane County to re-evaluate the potential health impact of Project discharges based on other criteria.

* * * * * * * *

This technical memorandum presents comments on major issues identified by Landau Associates in Ecology's December 22, 1992 letter regarding Project NPDES considerations. There may be other, less significant, NPDES issues that result from Ecology's letter which are not addressed herein. Spokane County should make it clear to Ecology that failure to take exception with any of Ecology's statements in their letter at this time does not necessarily indicate concurrence with those statements. Spokane County should reserve the right to pursue further negotiation or legal action on any substantive NPDES requirements that Ecology identifies in this or any future documents. If you have any questions regarding this technical memorandum or other NPDES issues, please contact Landau Associates.

LDB/sms
No. 124001.78

Technical Memorandum

TO: Mike Kuntz, Washington State Department of Ecology

FROM: Lawrence D. Beard, P.E., Landau Associates, Inc

RE: **BACKGROUND WATER QUALITY DATA, PREDICTED TREATED GROUNDWATER QUALITY, AND EVALUATION OF POTENTIAL NPDES DISCHARGE CRITERIA FOR COLBERT LANDFILL PHASE II EFFLUENT**

DATE: September 25, 1992 (Revised February 8, 1993)

This memorandum presents the results of background water quality analyses, prediction of treated groundwater (effluent) quality, and the evaluation of potential NPDES discharge criteria for effluent from the proposed Colbert Landfill Phase II treatment facility. The scope of these activities is based on Landau Associates' June 26, 1992 technical memorandum, the Washington State Department of Ecology (Ecology) July 27, 1992 letter, and discussions between Larry Beard (Landau Associates) and Bonnie Rose (Ecology). This memorandum was prepared by Landau Associates at the request of Spokane County.

BACKGROUND WATER QUALITY SAMPLING AND ANALYSES

Characterization of background water quality included sampling and analysis of representative groundwater monitoring wells and surface water from the Little Spokane River. Groundwater samples were collected at the site on July 21-22, 1992, from groundwater Monitoring Wells CD-21C1, CD-30A, CD-46C2, and CD-47C2. A surface water sample was collected from the Little Spokane River on July 22, 1992 at the proposed Phase II outfall location. Analytical data are presented in Table 1.

All groundwater samples were analyzed for constituents identified in Landau Associates' June 26, 1992 memorandum, including metals (total and dissolved), inorganic/conventional parameters, organochlorine pesticides/PCBs, organophosphorus pesticides, and herbicides. Samples were not analyzed for dissolved arsenic (V), arsenic (III), or chromium (VI). Also, the sample from Monitoring Well CD-30A was not analyzed for turbidity. These omissions resulted from laboratory error, but do not significantly affect the evaluation of potential NPDES criteria.

No semivolatile compounds were detected in the sample from Monitoring Well CD-21C1. Since groundwater in the Monitoring Well CD-21C1 vicinity is anticipated to have the highest impact from the Colbert Landfill, samples from other wells were not analyzed for these compounds. This approach was implemented with concurrence of Ecology.

The sample collected from the Little Spokane River was analyzed for total metals, inorganics/conventionals, organochlorine pesticides/PCBs, organophosphorus pesticides, herbicides, and other parameters. Although analyses for dissolved metals were requested in Ecology's July 27, 1992 letter, an equipment failure prevented collection of a filtered sample. This omission does not significantly impact the evaluation of potential NPDES criteria because the criteria are based on total metal concentrations, and total metal concentrations for all potential NPDES monitoring parameters are low or below method detection limits.

Groundwater and surface water samples were also analyzed for selected major ions at the request of Ecology in its April 28, 1992 comment letter on the draft Phase II Treatment and Discharge Plan. The major ions analyzed for were bicarbonate and total alkalinity, calcium, chloride, magnesium, nitrates, potassium, silicon, sulfate, hardness, and pH.

A quality assurance/quality control review of the analytical data was performed using EPA guidelines (EPA 1988a,b); data qualifiers are provided following EPA Contract Laboratory Program (CLP) guidelines (EPA 1988c). The data validation considered the following elements:

- Holding times
- Detection limits
- Surrogate recoveries
- Matrix spike results
- Blank analysis results
- Duplicate analysis results
- Data completeness.

No data were rejected as a result of data validation. All data met validation guidelines with the following exceptions:

- All samples exceeded the holding time of 48 hours for dissolved oxygen, total residual chlorine, and fecal coliform bacteria (possibly biassing the results low). Consequently, these results are flagged with a "J."
- Nitrate analysis exceeded the holding time of 48 hours for the Monitoring Well CD-47C2 groundwater sample. However, the laboratory reanalyzed the sample and the results were within quality control precision requirements. Consequently, the data were not flagged.
- Malathion recovery was 20 percent for the laboratory control sample, outside of the control limits of 40-120 percent. Although undetected, malathion results may be biased low. Consequently, malathion results are flagged "J".

ESTIMATED EFFLUENT QUALITY

Groundwater Contributions

During Phase II remedial action, groundwater from the vicinity of the sampled wells will contribute different percentages to the total effluent. It is expected that the areas surrounding the wells will contribute the following percentages:

Monitoring Well Designation	Estimated Relative Contribution (%)
CD-21C1	15
CD-30A	33
CD-46C2	26
CD-47C2	26

It was initially intended that a composite from these wells would be prepared and analyzed using the relative contributions identified above. However, samples from the wells were individually analyzed at the request of Ecology, and the estimated total effluent concentrations presented in Table 1 were calculated from individual well data.

Effluent Contributions From Sequestering Agent and Batch Cleaning Solution

The estimated effluent concentrations in Table 1 reflect addition of a sequestering agent to the groundwater to control scale accumulation in the stripping tower; and addition of an acid batch cleaning solution to the effluent stream, following periodic batch cleaning to remove accumulated scale.

Phosphate and nonphosphate sequestering agents are available for calcium carbonate scale control. Although nonphosphate sequestering agents do not have a significant performance record, bench scale test results indicate that a nonphosphate sequestering agent (NALCO 8357 polyacrylate scale inhibitor) may provide adequate scale control for Phase II operation. Also, material safety data sheet (MSDS) information, previously provided to Ecology, indicates this nonphosphate sequestering agent is nontoxic to humans and aquatic organisms at the planned effluent concentrations. Therefore, nonphosphate sequestering agents will be evaluated during initial Phase II operation; and, if a nonphosphate sequestering agent performs adequately, it will be used for long-term scale control. If the nonphosphate sequestering agent does not perform adequately, a phosphate sequestering agent will be used. The estimated effluent concentration in Table 1 includes an estimated sequestering agent phosphorus contribution of 0.54 ppm, based on a phosphate sequestering agent addition rate of 10 ppm. Estimated effluent concentrations

include only the total dissolved solids (TDS) contribution from the nonphosphate sequestering agent, because MSDS data indicate it does not contain any constituents of concern.

The acid batch cleaning solution will contain calcium carbonate (from dissolved scale) and low concentrations of heavy metals that are present in the accumulated scale and the hydrochloric acid used for batch cleaning. The rate of scale accumulation (and, therefore, the frequency of acid batch cleaning) cannot be accurately determined until the Phase II remedial action is operating. However, bench scale test results, to be presented in the final Phase II Treatment and Discharge Plan, provide an upper bound to potential scale accumulation, and were used to develop the estimated acid batch cleaning solution constituent concentrations and the impact on estimated effluent concentrations and mass loadings. These estimates were made assuming a scale accumulation rate of 60 lb per day, a batch cleaning frequency of approximately every 280 days, use of 3,600 gal of 35 percent HCL, an effluent discharge rate of 1,600 gpm, and an acid batch cleaning solution addition rate to the effluent of 0.1 gpm.

Comparison of Estimated Effluent Quality to River Background

Comparison of estimated effluent water quality data to Little Spokane River background water quality data indicates that estimated effluent concentrations for some constituents are higher than for the Little Spokane River, but are lower for other constituents. Estimated effluent concentrations are higher for barium, calcium, magnesium, potassium, silicon, alkalinity, hardness, nitrate, phosphorus, and TDS. However, Little Spokane River concentrations are higher for iron, chemical oxygen demand (COD), chloride, fecal coliform, and total organic carbon (TOC). Although each exhibits different characteristics, estimated water quality for effluent water and for the Little Spokane River appear to be similar.

POTENTIAL NPDES CRITERIA

Ecology identified a number of potential NPDES criteria in its April 28, 1992 comment letter on the draft Phase II Treatment and Discharge Plan. These potential NPDES criteria, presented in Table 2, consist of freshwater aquatic criteria identified in WAC 173-201 (-045 Class A waters, and -047) and Federal freshwater aquatic and human health water quality criteria (EPA 1986). During the June 19, 1992 meeting with Ecology, it was agreed that NPDES criteria would only be established for constituents detected in groundwater at levels of concern and above their practical quantitation limit (PQL). It was also agreed that analyses would be performed using standard EPA methods.

Comparison of the estimated effluent concentration in Table 1 to the potential NPDES parameters in Table 2 indicate that almost all parameters, except the volatile organic constituents of concern, are either not detected or are significantly below the potential NPDES criteria. No pesticides, PCBs, herbicides, semivolatile organic compounds, or miscellaneous parameters were detected. Barium, iron, and manganese were the only metals detected that are potential NPDES parameters; however, the estimated effluent concentrations for these parameters are about 2-9 times less than the potential NPDES criteria.

Ammonia, nitrate, pH, and TDS were the only conventional parameters with identified potential NPDES criteria that were detected in groundwater. Ammonia and nitrate were detected at concentrations significantly below the potential NPDES criteria.

The estimated maximum Phase II effluent pH is 8.4, based on laboratory bench scale tests and Phase I pilot studies. The potential NPDES criteria for pH is 8.5, based on Washington water quality criteria (WAC 173-201-45). Although the bench scale tests conducted indicated effluent pH could be as high as 8.5, this is attributed to the excessive aeration used to cause scale formation during these tests. The maximum pH observed during Phase I pilot studies was about 8.3. Therefore, it is probable that during Phase II operation a pH of 8.5 will be approached, but not exceeded.

It is important to note that the pH of the Little Spokane River was measured at 8.5 on September 4, 1992, and a subsequent measurement on September 9, 1992 indicated a pH of 8.4. The September pH value is probably a seasonal, low-flow phenomena, but it indicates that the background river pH will probably meet or exceed potential NPDES criteria for pH on at least an intermittent basis. As a result, NPDES pH discharge criteria should be set at a pH of 8.5 or background river pH, whichever is higher.

The estimated effluent concentration for TDS of 465 mg/L exceeds the potential NPDES criteria of 250 µg/L, based on federal water quality standards (EPA 1986). Hardness, alkalinity, and TDS data in Table 1 indicate that effluent water TDS results largely from the presence of calcium carbonate. However, TDS criteria are based on possible physiological effects, taste, and water system maintenance costs for sulfates and sodium, constituents that do not represent an appreciable percentage of TDS for Phase II effluent. As a result, the potential NPDES criteria for TDS identified in the federal water quality standards should not be applied to Phase II effluent discharges.

Potential NPDES criteria were identified for four of the six volatile organic constituents of concern detected at the site, including tetrachloroethylene (PCE), 1,1-dichloroethylene (DCE), 1,1,1-trichloroethane (TCA), and trichloroethylene (TCE). Estimated effluent concentrations

presented in Table 1 for these constituents indicate that PCE, DCE, and TCE concentrations will exceed their respective potential NPDES criteria. However, the estimated effluent concentrations for the constituents of concern are set at the discharge limits identified in the Project Consent Decree. The anticipated effluent concentrations for these constituents are actually less than 1 ppb, based on the results of the Phase I pilot study. Therefore, effluent concentrations for these constituents are anticipated to be below potential NPDES criteria. However, the discharge limits established for the site were developed in conjunction with EPA and Ecology, and the application of more stringent criteria at this time would not be appropriate. Applying NPDES criteria consistent with Table 2 would not conflict with the Project Consent Decree discharge limits if a dilution zone is established for NPDES sampling.

WAC 173-201-045 identifies a maximum discharge criteria for total dissolved gasses of 110 percent of saturation. The percent saturation of total dissolved gases for effluent cannot be determined until Phase II operation, but the selected treatment method (air stripping) may result in exceedance of this criteria because of the entrainment of air during treatment. However, the impact of effluent potentially supersaturated with air should be minimized by the relatively small maximum contribution of the effluent to total river flow of less than 5 percent of $Q_{7,10}$ low flow[1]. If the discharge criteria for total dissolved gases is exceeded at the point of discharge, it is anticipated that the criteria can be attained at the boundary of a dilution zone.

The potential NPDES criteria for some constituents (primarily metal, pesticide, PCB and semivolatile compounds with carcinogenic criteria) are significantly below the PQLs for background water quality analyses. Therefore, criteria could be exceeded for some constituents, but the exceedances would be undetected. There are a number of factors that suggest the potential for this to occur is limited:

- Data presented in Project documents do not indicate that significant quantities of waste containing these constituents were disposed of at the Colbert Landfill
- The parameters in question tend to have relatively high soil partition coefficients and, thus, are not highly mobile in groundwater
- These constituents were not detected in groundwater samples from any of the monitoring wells sampled for this investigation. Because the source of groundwater in the vicinity of these wells varies, it is likely that the presence of these constituents (if present at all) would be limited to a few wells, and concentration would be reduced by the contribution of groundwater extracted from other areas

[1] $Q_{7,10}$ is the estimated 7-day average flow that is exceeded (on the low side) only once every 10 years, and is equal to 75 cfs for the Little Spokane River (EPA 1987).

- Groundwater solute transport modeling accomplished for design of the treatment facility (Landau Associates 1992) indicates extraction system water quality will improve significantly within the first 2 years of operation (as downgradient "clean" water reaches the extraction wells). Therefore, any low or undetected concentrations of potential constituents of concern will be further reduced with time.

It is also important to recognize that the health-based potential NPDES criteria for many of these constituents are in the part per trillion range, or lower. In most cases, treatment technologies do not currently exist that can achieve these criteria, particularly for the relatively high flow rates of 1,000 gpm (or more) anticipated for the Phase II remedial action. Therefore, even if a criterion exceedance occurred for one or more of these parameters, it is likely that effective treatment would be either technically unfeasible or impracticable.

RECOMMENDED NPDES MONITORING PARAMETERS AND ASSOCIATED CRITERIA

The background water quality data and estimated Phase II effluent concentrations presented in this memorandum, and potential NPDES monitoring parameters identified by Ecology, provide an adequate basis for developing NPDES monitoring parameters and discharge criteria for most of these parameters. Recommended monitoring parameters and criteria are presented in Table 3 for Ecology's review and consideration.

REFERENCES

Landau Associates, Inc. 1992. Final Extraction Well Plan, Phase II Remedial Design/Remedial Action, Colbert Landfill, Spokane, Washington. Prepared for Spokane County Utilities Department, August 7.

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U.S. Environmental Protection Agency. 1988b. Laboratory Data Validation, Functional Guidelines for Evaluating Organics Analysis, Hazardous Site Evaluation Division.

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This memorandum reflects Spokane County's understanding of the investigation and analyses needed to develop NPDES criteria for discharging treated groundwater from the Colbert Landfill Phase II remedial action to the Little Spokane River, based on discussions with Ecology during the June 19, 1992 meeting. NPDES criteria must be established prior to resuming design of the final remedial action to minimize the potential of designing a remedial action that does not achieve NPDES discharge criteria. To avoid further delays in design of the Phase II remedial action, Spokane County requests a verbal response from Ecology as soon as this memorandum has been reviewed to determine whether there is substantive agreement between Ecology and Spokane County as to NPDES monitoring parameters and criteria. If substantive agreement is not achieved, Spokane County requests that a meeting be held to resolve any disagreement prior to Ecology issuing a written response to this memorandum. Spokane County believes this approach will expedite resolution of any NPDES issues and allow resumption of Phase II design as soon as possible.

If you have any questions, please contact Dean Fowler (Spokane County) or Landau Associates.

LDB/sms
No. 124001.78

TABLE 1
BACKGROUND WATER QUALITY DATA AND ESTIMATED EFFLUENT QUALITY
COLBERT LANDFILL RD/RA PROJECT
(Concentrations in ug/L-except when indicated otherwise)

Constituent	Analytical Method	CD21C1	CD47	CD46	CD46-DUP	CD30A	Little Spokane River	Estimated Acid Batch Cleaning Solution Concentration	Estimated Effluent Concentration (a)	Estimated Effluent Mass Loading (b) (lb/day)
METALS (Total, in mg/l)										
Aluminum	EPA 6010	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	76	0.055	NC
Antimony	EPA 6010	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	3 <	0.05 U	NC
Arsenic	EPA 7060	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	11 <	0.006	NC
Arsenic (pent)	EPA 7060	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	NC	0.005 U	NC
Arsenic (tri)	EPA 7060	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	NC	0.005 U	NC
Barium	EPA 6010	0.271	0.079	0.292	0.297	0.114	0.052	36	0.18	3.4
Beryllium	EPA 6010	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	1 <	0.005 U	NC
Cadmium	EPA 6010	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	1 <	0.003 U	NC
Calcium	EPA 6010	172	60.6	140	143	104	30.3	42000	115	2200
Chromium (hex)	EPA 7195/6010	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NC	0.01 U	NC
Chromium (total)	EPA 6010	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	1 <	0.005 U	NC
Copper	EPA 6010	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	1	0.01 U	NC
Iron	EPA 6010	0.033	0.02 U	0.065	0.068	0.02 U	0.099	192	0.046	0.88
Lead	EPA 7421	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	5 <	0.002 U	NC
Magnesium	EPA 6010	60.3	19.5	48.6	49.5	22.5	7.37	294	34	660
Manganese	EPA 6010	0.014	0.005 U	0.077	0.078	0.005 U	0.018	6	0.025	0.49
Mercury	EPA 7470	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	5 <	0.0008 U	NC
Nickel	EPA 6010	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.24 <	0.02 U	NC
Potassium	EPA 6010	4.9	2.9	3.8	4.1	3.3	2 U	56 <	3.6	70
Selenium	EPA 7740	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	11 <	0.006 U	NC
Silicon	EPA 6010	12.9	11.5	12.3	2.6	9.64	8.34	10 <	11.3	220
Silver	EPA 6010	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	1 <	0.01 U	NC
Thallium	EPA 7841	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	11 <	0.006 U	NC
Zinc	EPA 6010	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	308	0.03	0.56
METALS (Dissolved, in mg/l)										
Aluminum	EPA 6010	0.056	0.05 U	0.05 U	0.055	0.05 U	NT	76	0.056	NC
Antimony	EPA 6010	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	NT	3 <	0.050 U	NC
Arsenic	EPA 7060	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	NT	11	0.006 U	NC
Arsenic (pent)	WF	NT	NT	NT	NT	NT	NT	NC	NC	NC
Arsenic (tri)	WF	NT	NT	NT	NT	NT	NT	NC	NC	NC
Barium	EPA 6010	0.269	0.081	0.301	0.303	0.111	NT	36	0.179	NC
Beryllium	EPA 6010	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	NT	1 <	0.005 U	NC
Cadmium	EPA 6010	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	NT	1 <	0.003 U	NC
Calcium	EPA 6010	171	62.4	144	145	102	NT	42000	116	NC
Chromium (hex)	EPA 7195/6010	NT	NT	NT	NT	NT	NT	NC	NC	NC
Chromium (total)	EPA 6010	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	NT	1 <	0.005 U	NC
Copper	EPA 6010	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NT	1	0.010 U	NC
Iron	EPA 6010	0.033	0.02 U	0.05	0.051	0.02 U	NT	192	0.042	NC
Lead	EPA 7421	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	NT	5 <	0.002 U	NC
Magnesium	EPA 6010	59.8	20.7	49.4	50	22	NT	294	34.5	NC
Manganese	EPA 6010	0.014	0.005 U	0.075	0.077	0.005 U	NT	6	0.025	NC
Mercury	EPA 7470	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	NT	5 <	0.001 U	NC
Nickel	EPA 6010	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	NT	0.24 <	0.020 U	NC
Potassium	EPA 6010	5	3.3	4	3.8	3.3	NT	56 <	3.74	NC
Selenium	EPA 7740	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	NT	11 <	0.006 U	NC
Silicon	EPA 6010	12.8	11.9	12.5	12.7	9.41	NT	10 <	11.37	NC
Silver	EPA 6010	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NT	1 <	0.010 U	NC
Thallium	EPA 7841	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	NT	11 <	0.006 U	NC
Zinc	EPA 6010	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NT	308	0.03	NC

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COLBERT LANDFILL RD/RA PROJECT
(Concentrations in ug/L-except when indicated otherwise)

Constituent	Analytical Method	CD21C1	CD47	CD46	CD46-DUP	CD30A	Little Spokane River	Estimated Acid Batch Cleaning Solution Concentration	Estimated Effluent Concentration (a)	Estimated Effluent Mass Loading (b) (lb/day)
INORGANICS/CONVENTIONALS										
Alkalinity (mg/L)	EP 310.1	642	221	554	556	325	107	NC	405	7800
Ammonia (total as N) (mg/L)	EP 350.3	0.07	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.04 <	0.053	NC
Bicarbonate Alkalinity(mg/L)	SM 2320B	642	221	554	556	325	104	NC	405	7800
BOD (mg/L)	EP 405.1	4 U	4 U	4 U	4 U	4 U	4 U	3 <	4 U	NC
COD (mg/L)	EP 410.2	5 U	5 U	5 U	5 U	5 U	10	4 <	5 U	NC
Chloride (mg/L)	EP 300.0	7.2	3.9	270	290	300	340	75220	176	3400
Chlorine-Residual (mg/L)	EP 330.4	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	2 <	0.1 U	NC
Coliform Fecal (CFU/100mL)	SM 9221C	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	50 J	NC	2 U	NC
Color (CU)	EP 110.2	20 U	20 U	20 U	20 U	20 U	20 U	NC	20 U	NC
Cyanide (mg/L)	EP 335.2	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 <	0.01 U	NC
Gases, Total Dissolved	N/A (c)	NT	NT	NT	NT	NT	NT	NC	NC	NC
Hardness (mg/L)	EPA 6010	673	241	563	568	344	106	42000	426	8200
Nitrates (mg/L)	EP 300.0	1.4	5.1	2.8	2.8	2.9	0.6	4	3.2	62
Oil and Grease (mg/L)	EP 413.1	1 U	1 U	1 U	1 U	1 U	1 U	1 <	1 U	NC
Oxygen Dissolved (mg/L)	EP 360.1	1.6 J	7.3 J	4.00 J	3.70 J	8.20 J	8.25 J	NC	5.9	NC
pH (d)	EP 150.1	6.7	7.7	7.2	7.2	7.1	8.5	2	7.2	NC
Phosphorus-Total (mg/L)	EP 365.3	0.240 mg/L	1.600	0.500	0.501	0.010 U	0.021	1000	1.100 (d)	22
Solids Suspended - Nonfilterable (mg/L)	EP 160.2	5 U	5 U	5 U	5 U	5 U	5 U	6	5 U	NC
Solids Dissolved - Filterable (mg/L)	EP 160.1 TDS	677	295	591	597	368	127	184000	465	8900 TDS
Sulfate (mg/L)	EP 300.0	20	13	12	12	25	16	17	18	340
Sulfide-Hydrogen Sulfide (mg/L)	EP 376.1	2 U	2 U	2 U	2 U	2 U	2 U	2 <	2 U	NC
Temperature (°C) (e)	EP 170.1	13.1	11.9	13.9	13.9	12.1	NT	NC	12.7	NC
TOC (mg/L)	EP 415.1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.8	0.4 <	0.5 U	NC
Turbidity (NTU)	EP 180.1	0.1 U	0.2	0.6	NT	NT	NT	NC	NC	NC
ORGANOCHLORINE PESTICIDES/ PCBs										
Aldrin	EPA 8080	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	NC	0.04 U	NC
BHC	EPA 8080	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	NC	0.04 U	NC
Chlordane	EPA 8080	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NC	0.5 U	NC
DDT	EPA 8080	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	NC	0.04 U	NC
DDT Metabolite (DDE)	EPA 8080	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	NC	0.04 U	NC
DDT Metabolite (TDE)	EPA 8080	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	NC	0.04 U	NC
Dieldrin	EPA 8080	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	NC	0.04 U	NC
Endosulfan	EPA 8080	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	NC	0.04 U	NC
Endrin	EPA 8080	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	NC	0.04 U	NC
Heptachlor	EPA 8080	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	NC	0.04 U	NC
Hexachlorocyclohexane (Lindane)	EPA 8080	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	NC	0.04 U	NC
Hexachlorocyclohexane-Alpha	EPA 8080	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	NC	0.04 U	NC
Hexachlorocyclohexane-Beta	EPA 8080	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NC	0.1 U	NC
Methoxychlor	EPA 8080	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NC	0.1 U	NC
PCBs	EPA 8080	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NC	0.2 U	NC
Mirex	EPA 8080	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	NC	0.04 U	NC
ORGANOPHOSPHORUS PESTICIDES										
Chlorpyrifos	EPA 8141	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NC	0.5 U	NC
Demeton	EPA 8141	1 U	1 U	1 U	1 U	1 U	1 U	NC	1 U	NC
Guthion	EPA 8141	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NC	0.5 U	NC
Malathion	EPA 8141	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	NC	0.5 U	NC
Parathion-methyl	EPA 8141	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NC	0.5 U	NC
HERBICIDES										
Chlorophenoxy Herbicides (2,4,5,-TP)	EPA 8150	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NC	0.2 U	NC
Chlorophenoxy Herbicides (2,4,-D)	EPA 8150	1 U	1 U	1 U	1 U	1 U	1 U	NC	1 U	NC

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Constituent	Analytical Method	CD21C1	CD47	CD46	CD46-DUP	CD30A	Little Spokane River	Estimated Acid Batch Cleaning Solution Concentration	Estimated Effluent Concentration (a)	Estimated Effluent Mass Loading (b) (lb/day)
SEMIVOLATILE ORGANICS										
Acenapthene	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Benzidine	EPA 8270	50 U	NT	NT	NT	NT	NT	NC	50 U	NC
Chlorinated Benzenes (f)	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Chlorinated Napthalenes (g)	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Chloroethyl Ether (bis-2)	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Chloroisopropyl Ether (bis-2)	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Chloromethyl Ether (bis)	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Chlorophenol 2	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Chloro-4,Methyl-3,Phenol	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Dibutyl Phthalate	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Dichlorobenzenes (h)	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Dichlorobenzidine 3,3	EPA 8270	20 U	NT	NT	NT	NT	NT	NC	20 U	NC
Dichlorophenol 2,4	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Diethylphthalate	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Dimethyl Phenol 2,4	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Dimethyl Phthalate	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Dinitrotoluene 2,4	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Dinitro-o-cresol 2,4	EPA 8270	20 U	NT	NT	NT	NT	NT	NC	20 U	NC
Diphenylhydrazine 1,2	EPA 8270	20 U	NT	NT	NT	NT	NT	NC	20 U	NC
Di-2-Ethyl Hexyl Phthalate	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Fluoranthene	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Hexachlorobenzene	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Hexachlorobutadiene	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Hexachlorocyclopentadiene	EPA 8270	10 U	NT	NT	NT	NT	NT	NC	10 U	NC
Hexachloroethane	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Isophorone	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Naphthalene	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Nitrobenzene	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Nitrophenols (i)	EPA 8270	50 U	NT	NT	NT	NT	NT	NC	50 U	NC
Nitrosodibutylamine N	EPA 8270	10 U	NT	NT	NT	NT	NT	NC	10 U	NC
Nitrosodiethylamine N	EPA 8270	10 U	NT	NT	NT	NT	NT	NC	10 U	NC
Nitrosodimethylamine N	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Nitrosodiphenylamine N	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Nitrosopyrrolidine N	EPA 8270	10 U	NT	NT	NT	NT	NT	NC	10 U	NC
Pentachlorobenzene	EPA 8270	10 U	NT	NT	NT	NT	NT	NC	10 U	NC
Pentachlorophenol	EPA 8270	30 U	NT	NT	NT	NT	NT	NC	30 U	NC
Phenol	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Phthalate Esters (j)	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Polynuclear Aromatic Hydrocarbons (k)	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Tetrachlorobenzene 1,2,4,5	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Trichlorophenol 2,4,5	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
Trichlorophenol 2,4,6	EPA 8270	5 U	NT	NT	NT	NT	NT	NC	5 U	NC
VOLATILE ORGANICS (l)										
1,1-Dichloroethane	EPA 8010	NT	NT	NT	NT	NT	NT	NC	180 (m)	3.5
1,1-Dichloroethylene	EPA 8010	NT	NT	NT	NT	NT	NT	NC	7.0 (m)	0.13
Methylene chloride	EPA 8010	NT	NT	NT	NT	NT	NT	NC	25 (m)	0.48
Tetrachloroethylene	EPA 8010	NT	NT	NT	NT	NT	NT	NC	7.0 (m)	0.13
Trichloroethane 1,1,1	EPA 8010	NT	NT	NT	NT	NT	NT	NC	200 (m)	3.8
Trichloroethylene	EPA 8010	NT	NT	NT	NT	NT	NT	NC	5 (m)	0.1

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Constituent	Analytical Method	CD21C1	CD47	CD46	CD46-DUP	CD30A	Little Spokane River	Estimated Acid Batch Cleaning Solution Concentration	Estimated Effluent Concentration (a)	Estimated Effluent Mass Loading (b) (lb/day)
MISCELLANEOUS										
Acrolein	EPA 8240	10 U	10 U	10 U	10 U	10 U	10 U	NC	10 U	NC
Acrylonitrile	EPA 8240	100 U	100 U	100 U	100 U	100 U	100 U	NC	100 U	NC

Analytical Methods

EPA SW-846 Test Methods for Evaluating Solid Waste, 1986 with 1987 revisions.
EPA 6010 = Inductively Coupled Plasma Atomic Emission Spectroscopy
EPA 7195 = Chromium, Hexavalent (Coprecipitation)
EPA 8010 = Halogenated Volatile Organics.
EPA 8030 = Acrolein, Acrylonitrile, Acetonitrile.
EPA 8080 = Organochlorine Pesticides and PCBs.
EPA 8141 = Organophosporus Pesticides.
EPA 8150 = Chlorinated Herbicides.
EPA 8240 = GC/MS for Volatile Organics
EPA 8270 = GC/MS for Semivolatile Organics
EPA 8290 = Dibenzo-p-dioxins and furans.
EPA 9010 = Cyanide
WF = Walter Ficklin, U.S.G.S. "Separation of As(III) and As(V) in Groundwater".
EP = Methods of Chemical Analysis of Water and Wastes, EPA 1983.
SM = Standard Methods.

Abbreviations and Data Qualifications:

°C = Degrees Centigrade.
ml = milliliter.
NC = Not calculated.
NT = Not tested.
NTU = Nephelometric turbidity units.
U = Undetected at the detection limit given.
J = The analyte was analyzed and positively identified, but the associated numerical value may not be consistent with the amount actually present in the environmental sample.
UJ = The analyte was anlyzed for and was not present above the associated value. The associated value may not accurately or precisely represent the concentration necessary to detect the analyte in this sample.
< = The constituent was less than the associated calculated value. The associated value may not accurately or precisely represent the concentration necessary to detect the analyte in this sample.

Footnotes:

(a) This is a calculated value based on the estimated contribution of groundwater to the Phase II system from the vicinity of the sampled wells, and discharge of the batch cleaning solution. The concentration estimate is based on a total extraction rate of 1,600 gpm, with contributions of 15%, 33%, 26%, and 26% for Wells CD-21C1, CD-30A, CD-46C2, and CD-47C2, respectively, and a 0.1 gpm discharge rate of the batch cleaning solution.
(b) Based on effluent discharge rate of 1,600 gpm at the estimated effluent concentration.
(c) Not listed in any available method references.
(d) Includes 0.54 mg/l contribution from phosphate sequestering agent.
(e) Values are based on field results.
(f) The sum of 1,2-, 1,3-,1,4-dichlorobenzene, 1,2,4-trichlorobenzene, and hexachlorobenzene.
(g) Value is for 2-chloronaphthalene only.
(h) The sum of 1,2-, 1,3-, and 1,4-dichlorobenzene.
(i) The sum 2- and 4-nitrophenol and 2,4-dinitrophenol.
(j) The sum of dimethylphthalate, diethylphthalate, di-n-butylphthalate, butylbenzlphthalate, bis(2-ethythexyl)phthalate and di-n-octylphthalate.
(k) The sum of carcinogenic PAH: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene.
(l) Volatile organics were not tested for, with the concurrance of Ecology, because of the adequacy of existing data.
(m) Effluent discharge standards (Evaluation Criteria) from Project Consent Decree, except for 1,1-DCA (which is highest measured concentration).

TABLE 2

POTENTIAL NPDES WATER QUALITY CRITERIA
COLBERT LANDFILL RD/RA PROJECT
(Concentrations in ug/L)

Constituent	PQL (b)	Federal Water Quality Criteria (a)				State WAC 173-201
		Aquatic Fresh Chronic	Water and Fish Ingestion (c)	Fish Consumption Only	Drinking Water MCL	Fresh Chronic (d)
METALS						
Antimony	60.0	1600.0 (e)	146.0	45000.0		
Arsenic	10.0		0.0022 (f)	0.018 (f)	50.0	
Arsenic (pent)	-	48.0 (e)				
Arsenic (tri)	-	190.0				
Barium	200.0		1,000		1,000	
Beryllium	5.0	5.3 (e)	0.0068 (f)	0.12 (f)		
Cadmium	5.0	1.1 (g)	10.0		10.0	1.1 (g,h)
Chromium (hex)	10.0	11.0	50.0		50.0	11.0 (h)
Chromium (tri)	10.0	210.0 (g)	1.7E+05	3.4E+06	50.0	210.0 (g,h)
Copper	25.0	12.0 (g)				12.0 (g,h)
Iron	100.0	1000.0	300.0			
Lead	3.0	3.2 (g)	50.0		50.0	3.2 (g,h)
Manganese	15.0		50.0	100.0		
Mercury	0.2	0.012	0.144	0.146	2.0	0.012 (h)
Nickel	40.0	160.0 (g)	13.4	100.0		160.0 (g,h)
Selenium	5.0	35.0	10.0		10.0	35.0 (h)
Silver	10.0	0.12	50.0		50.0	
Thallium	10.0	40.0 (e)	13.0	48.0		
Zinc	20.0	110.0 (g)				110.0 (g,h)
INORGANICS/CONVENTIONALS						
Alkalinity	1.0	20,000 (i)				
Ammonia (total as N)	0.0	1808.0 (h,j,k)				1808.0 (h,j,k)
Chlorine (residual)	0.1	11.0				11.0 (h)
Coliform Fecal	N/A				<1/100mlg	<100/100ml
Color	1.0	25.0 (l)				
Cyanide	10.0	5.2	200.0			5.2 (h)
Gasses, Total Dissolved	N/A	110% saturation (k,m)				110% saturation (k,n)
Nitrates	N/A		10,000		10,000	
Oil and Grease	5.0	Surface water to be free of floating oil --				
Oxygen Dissolved	0.1	8000.0 (i,m)				8000.0 (i,n)
pH	N/A	6.5-9.0 (o)				6.5-8.5 (o)
Solids Suspended	N/A	(p)				
Solids Dissolved	N/A		2.5E+05			
Sulfide-Hydrogen Sulfide	0.1	2.0				
Temperature (°C)	N/A	18.0 (n,q)				18 C (n)
TOC						
Turbidity (NTU)	0.5					<5 NTU over BKG (n)

Phosphorous ?

TABLE 2

POTENTIAL NPDES WATER QUALITY CRITERIA
COLBERT LANDFILL RD/RA PROJECT
(Concentrations in ug/L)

Constituent	PQL (b)	Federal Water Quality Criteria (a)				State WAC 173-201
		Aquatic Fresh Chronic	Water and Fish Ingestion (c)	Fish Consumption Only	Drinking Water MCL	Fresh Chronic (d)
ORGANOCHLORINE PESTICIDES/PCBs						
Aldrin	0.1	3.0 (k)	7.4E-05 (f)	7.9E-05 (f)		
BHC	0.1	100.0 (e,k)				
Chlordane	0.1	0.0043	4.6E-04 (f)	4.8E-04		0.0043 (g,r)
DDT	0.1	0.001	2.4E-05 (f)	2.4E-05 (f)		
DDT Metabolite (DDE)	0.1	1050.0 (e,k)				
DDT Metabolite (TDE)	N/A	0.06 (e,k)				
Dieldrin	0.02, 0.1	0.002	7.0E-05 (f)	7.6E-04 (f)		
Endosulfan	0.14, 0.04; 0.1	0.056	74.0	159.0		0.056 (r)
Endrin	0.06, 0.1	0.0023	1.0		0.2	0.0023 (r)
Heptachlor	0.1	0.004	2.6E-04 (f)	2.9E-04 (f)		0.0038 (r)
Hexachlorocyclohexane (Lindane)	0.1	0.06	0.0186 (f)	0.0625 (f)	4.0	0.08 (r)
Hexachlorocyclohexane-Alpha	0.1		0.0092 (f)	0.031 (f)		
Hexachlorocyclohexane-Beta	0.1		0.0163 (f)	0.054 (f)		
Methoxychlor	0.5	0.03	100.0		100.0	
PCBs	1.0	0.014	7.9E-05 (f)	7.9E-05		0.014 (r)
Mirex	10.0	0.001				
Toxaphene	5.0	0.0002	7.1E-04 (f)	7.3E-04 (f)	5.0	0.0002 (h)
ORGANOPHOSPHORUS PESTICIDES						
Chlorpyrifos	0.7	0.041				0.041 (h)
Demeton	1.2	0.1				
Guthion	N/A	0.01				
Malathion	50.0	0.1				
Parathion	10.0	0.013				0.013 (h)
HERBICIDES						
Chlorophenoxy Herbicides (2,4,5,-TP)	1.7		10.0			
Chlorophenoxy Herbicides (2,4,-D)	12.0		100.0			
SEMIVOLATILE ORGANICS						
Acenapthene	10.0	520.0 (e)				
Benzidine	N/A	2,500	1.2E-04 (f)	5.3E-04 (f)		
Chlorinated Benzenes	N/A (s)	50.0 (e)				
Chlorinated Napthalenes	N/A (s)	1600.0 (e,k)				
Chloroethyl Ether (bis-2)	10.0		0.03 (f)	1.36 (f)		
Chloroisopropyl Ether (bis-2)	10.0		34.7	4360.0		
Chloromethyl Ether (bis)	N/A		0.00376 (f)	0.0018 (f)		
Chlorophenol 2	10.0	2,000 (e)				
Chloro-4,Methyl-3,Phenol	10.0	30.0 (e,k)				

TABLE 2

POTENTIAL NPDES WATER QUALITY CRITERIA
COLBERT LANDFILL RD/RA PROJECT
(Concentrations in ug/L)

Constituent	PQL (b)	Federal Water Quality Criteria (a)			State WAC
		Aquatic Fresh Chronic	Water and Fish Ingestion (c)	Fish Consumption Only	Drinking Water MCL	173-201 Fresh Chronic (d)
SEMIVOLATILE ORGANICS (continued)						
Dibutyl Phthalate	10.0		35,000	1.5E+05		
Dichlorobenzenes	10.0	763.0 (e)	400.0	2600.0		
Dichlorobenzidine	20.0		0.01 (f)	0.02 (f)		
Dichlorophenol 2,4	10.0	365.0 (e)	3,090			
Diethylphthalate	10.0		3.5E+05	1.8E+06		
Dimethyl Phenol 2,4	10.0	2120.0 (e,k)				
Dimethyl Phthalate	10.0		3.1E+05	2.9E+06		
Dinitrotoluene 2,4	10.0		0.11 (f)	9.1 (f)		
Dinitro-o-cresol 2,4	50.0		13.4	765.0		
Diphenylhydrazine 1,2	N/A	270.0 (k)				
Di-2-Ethyl Hexyl Phthalate	10.0		15,000	50000.0		
Fluoranthene	10.0	3980.0 (e,k)	42.0	54.0		
Hexachlorobenzene	10.0	3.68	7.2E-04 (f)	7.4E-04 (f)		
Hexachlorobutadiene	10.0	9.3 (e)	0.45 (f)	50.0 (f)		
Hexachlorocyclopentadiene	10.0	5.2 (e)	206.0			
Hexachloroethane	10.0	540.0 (e)	1.9	8.7		
Isophorone	10.0	117000.0 (e,k)	5,200	5.2E+05		
Naphthalene	10.0	620.0 (e)				
Nitrobenzene	10.0	17000.0 (e,k)	19,800			
Nitrophenols	50.0	150.0 (e)				
Nitrosodibutylamine N	10.0		0.0064 (f)	0.587 (f)		
Nitrosodiethylamine N	20.0		8.0E-04 (f)	1.24 (f)		
Nitrosodimethylamine N	100.0		0.0014 (f)	16.0 (f)		
Nitrosodiphenylamine N	10.0		4.9 (f)	16.1 (f)		
Nitrosopyrrolidine N	40.0		0.016 (f)	91.9 (f)		
Pentachlorobenzene	10.0		74.0	85.0		
Pentachlorophenol	50.0	13.0 (t)	1,010		1000.0	
Phenol	10.0	2,560 (e)	3,500			
Phthalate Esters	N/A (s)	3.0 (e)				
Polynuclear Aromatic Hydrocarbons	N/A (s)		0.0028 (f)	0.031 (f)		
Tetrachlorobenzene 1,2,4,5	10.0		38.0	48.0		
Trichlorophenol 2,4,5	50.0		2,600			
Trichlorophenol 2,4,6	10.0	970.0 (e)	1.2 (f)	3.6 (f)		
VOLATILE ORGANICS						
Dichloroethylenes	1.3	11600.0 (e,k)	0.033 (f)	1.85 (f)		
Tetrachloroethylene	3.0	840.0 (e)	0.8 (f)	8.85 (f)		
Trichloroethane 1,1,1	0.3		18,400	1.03E+06	200.0 (v)	
Trichloroethylene	1.2	21900.0 (e)	2.7 (f)	80.7 (f)	5.0 (v)	

TABLE 2

POTENTIAL NPDES WATER QUALITY CRITERIA
COLBERT LANDFILL RD/RA PROJECT
(Concentrations in ug/L)

Constituent	PQL (b)	Federal Water Quality Criteria (a)				State WAC 173-201
		Aquatic Fresh Chronic	Water and Fish Ingestion (c)	Fish Consumption Only	Drinking Water MCL	Fresh Chronic (d)
MISCELLANEOUS						
Acrolein	7.0	21.0 (e)	320.0	780.0		
Acrylonitrile	5.0	2600.0 (e)	0.058 (f)	0.65 (f)		

N/A Not available.
°C = Degrees Centigrade.
MCL = maximum contaminant level
ml = milliliter.
NTU = National turbidity units.

(a) Quality Criteria for Water 1986 (EPA 440/5-86-001).
(b) PQL based on the analytical method identified in Table 1.
(c) Values presented in this column are human health-based only.
(d) Freshwater chronic criteria from WAC 173-201-047, except where noted otherwise
(e) Insufficient data to develop criteria. Value presented is the LOEL - lowest observed effect level.
(f) Human health criteria for carcinogens reported for three risk levels. Value presented is the 10-6 risk level.
(g) Hardness dependent criteria (100 mg/L used)
(h) A 4-day average concentration not to be exceeded more than once every three years on the average.
(i) The value represents a minimum concentration.
(j) Concentration based on pH = 6.5, temperature = 10°C, and salmonids present.
(k) Value presented is based on fresh acute criteria in absence of fresh chronic values.
(l) Criteria based on most stringent maximum value for sources of industrial water supply.
(m) State criteria based on interpretation of federal criteria.
(n) Criteria based on WAC 173-201-045 for general use ,Class A river.
(o) The values represent an acceptable range.
(p) Suspended solids should not reduce depth of photosynthetic compensation point by more than 10% from seasonal norm.
(q) A 1-hour average concentration not to be exceeded more than once every three years on the average.
(r) A 24-hour average not to be exceeded.
(s) See individual analytes for PQL and analytical method.
(t) pH dependent criteria (7.8 pH used)
(u) Effective August 8, 1987 FR Vol. 42, No. 130.

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TABLE 3

RECOMMENDED NPDES MONITORING PARAMETERS AND CRITERIA

Recommended Monitoring Parameter	Recommended Discharge Criteria[a]	Recommended Maximum Mass Loadings[b] (lb/day)	Recommended Monitoring Location
Barium	1	19	Outfall
Iron	0.3	5.8	Outfall
Manganese	0.05	1.0	Outfall
Total Dissolved Gases	110% saturation	N/A	Dilution zone boundary
Nitrates	10	190	Outfall
pH	pH $\leq$8.5[c]	N/A	Dilution zone boundary
1,1-Dichloroethylene	0.0013[d]	0.13[e]	Dilution zone boundary
Tetrachloroethylene	0.003[d]	0.13[e]	Dilution zone boundary
1,1,1-Trichloroethane	0.2	3.8	Dilution zone boundary
Trichloroethylene	0.0012[d]	0.1[e]	Dilution zone boundary
Phosphorous - ?			

(a) Criteria in mg/L.

(b) Mass loading based on effluent discharge rate of 1,600 gpm at the recommended discharge criteria concentration, except as noted otherwise.

(c) Receiving water pH may exceed 8.5 during certain periods. During such periods, pH criteria will be equal to receiving water pH.

(d) PQL for constituent, based on analysis by EPA Method 8010.

(e) Mass loading based on effluent discharge rate of 1,600 gpm at the Project Evaluation Criteria concentration.

Meeting Memorandum

To:	Dean Fowler (Spokane County)
From:	Larry Beard (Landau Associates) LB
Date:	January 15, 1993
Meeting Date:	January 11, 1993
Location:	EPA Region 10, Seattle, Washington
PURPOSE:	**NPDES/GROUNDWATER EXTRACTION ISSUES COLBERT LANDFILL RD/RA**

Attendees

Name	Firm	Phone
Dean Fowler	Spokane County	
Neil Thompson	EPA	
Mike Kuntz	Ecology	
Bonnie Rose	Ecology	(via conference call)
Larry Beard	Landau	

The purpose of the meeting was to discuss remaining NPDES issues for discharges treated effluent to the Little Spokane River, and discuss the impact of eliminating Extraction Wells CD-W4 and CD-E4 from the Lower Sand/Gravel Aquifer extraction system.

NPDES issues were the first item addressed and were also the most intensive. Bonnie Rose is the Ecology person evaluating NPDES requirements for the state, and is taking a very narrow, conservative view toward allowable discharges. The biggest issue is the discharge of phosphorous because of the low acceptable concentrations (25 µg/L) established for the Spokane River to address algae blooms in Long Lake. The various reasons why these criteria should not be applied directly to the project were discussed and consist primarily of:

- The criteria based largely on phosphorous limits established from the Memorandum of Agreement for phosphorous levels in Long Lake, which were developed subsequent to the Consent Decree and therefore should not apply to the project.
- The criteria were developed for the Spokane River, which is 20 river miles downgradient of the project discharge location on the Little Spokane River and thus are not directly comparable.

- It appears that phosphorous levels may be the result of background conditions and, because groundwater in the Colbert Landfill facility discharges to the Little Spokane River, should be "netted out" from consideration as additional load.
- The identified criteria (25 µg\L) are not actual federal or state criteria established based on any direct impact on human health or the environment and so only constitute only a "to be considered" constituent and not an actual criteria.

The only one of these points that Bonnie was willing to consider was demonstrating that phosphorous is a background condition and we did arrive at an agreement as to the how to go about assessing this. However, Bonnie was relatively inflexible on all other considerations; in fact, raised the issue of water quality in the Little Spokane River itself is a concern, even though neither the Memorandum of Agreement or the discharge criteria (25 µg\L) were developed for the Little Spokane River.

The approach of moving forward with the design and dealing with NPDES issues as a separate consideration was discussed. I presented this as an option because the probably time required to resolve all NPDES issues is likely to push final design and construction of the remedial action a minimum of 6 months to a year into the future, which may result in the existing facilities, and the facilities under construction, to no longer be a viable part of the remedial action.

In the process of discussing separation of NPDES and remedial design issues, Dean Fowler asked what EPA's position was with respect to phosphorous and NPDES issues. Neil Thompson indicated that it was his opinion that NPDES issues were addressed in the RI/FS, the ROD, and the Consent Decree, and the phosphorous criteria are something that has to be addressed, but are not actual criteria as EPA applies NPDES. Neil indicated that it is EPA's policy and approach to work toward rapid implementation of remedial actions and deal with some of the details (such as the phosphorous) after the remedial action is in place. Neil concurred that the proposed remedial action is not a commercial venture and is being pursued to protect human health and the environment, and therefore is not necessarily subject to the same degree of stringency as a commercial endeavor might be. Neil indicated it would be his recommendation to his boss to promote moving forward with design and that the phosphorous criteria should be examined but should not be a controlling factor for implementation of the remedial action.

Dean Fowler indicated that based on his evaluation of the potential risks associated with moving forward without NPDES issues resolved and not moving forward and allowing continued migration of the contaminant plume, combined with Neil's indication of EPA's position, that Spokane County would prefer to move forward with independent (although concurrently with) addressing NPDES issues. Both EPA and Ecology indicated that this was acceptable, although Mike still wants to make sure that the NPDES issues are addressed. In return, Dean requested that EPA and Ecology commit to reviewing the final treatment and discharge plan and the 90 percent design within the 30 days allocated in the original schedule, and they agreed to do so (or at least to try). I did indicate that it was our intent to change the schedule for other submittals slightly, and that we now intended to submit the preliminary operations and maintenance plan with the final (100 percent) design rather than the 90 percent design. Neil and Mike indicated that this would be acceptable.

The next issue discussed was the anomalous aquifer conditions encountered at the Extraction Well CD-W4 location that resulted in the elimination of this well, and the property access difficulties that resulted in the elimination of Extraction Well CD-E4. I presented groundwater modeling results that indicated capture could be achieved without either of these wells, although uncertain existed as to whether some contamination might escape around the south end of the granite anomaly. I also recommended that a well be constructed south of the anomaly to characterize water quality conditions, as well as hydraulic and hydrogeologic considerations, although the well had to be located on (b) (6) property (access previously denied) for it to be of value. EPA and Ecology appeared to agree and indicated that they would approach (b) (6) again (subsequent to receipt of a technical memorandum describing site conditions and the need for an additional monitoring well). However, both Mike and Neil concurred that seeking access using EPA's regulatory authority probably would not be pursued unless it was demonstrated that there was an imminent and substantial threat to human health and the environment, and that the existing modeling did not indicate that this was probably the case. As a result, it was decided that design and construction system could move forward without W4 or E4, but involuntary access to (b) (6) property would not be sought unless subsequent operation of the system indicated it was a necessity.

Prior to terminating the meeting (Dean left about 1/2 hour before we were done discussing the extraction wells to catch a flight), I reiterated the importance of resolving the NPDES issues and moving forward with design. Neil appears clearly in support and did not provide any support to Ecology for its position. Mike is also sympathetic, but appears to be more concerned with appeasing his coworkers and boss than putting his neck on the line and making the project move forward. He did indicate on a number of occasions that it might be necessary to kick it up over his head (and his boss' head) in order to get favorable consideration.

LDB/sms